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ABSTRACT

This book focuses on three particular context-specific accounts of scientific thinking. The first section of the book presents research focused on extending knowledge of the fundamental components of scientific thinking. In the second section, research is presented that is focused primarily on how to build a structure for scientific thinking in classrooms, museums, or for practicing scientists. The third section presents research focused on how to evaluate the effectiveness of artifacts in scientific settings. Papers include: (1) "'Seek and Ye Shall Find': How Curiosity Engenders Discovery" (Herbert A. Simon); (2) "Explanatory Conversations and Young Children's Developing Scientific Literacy" (Maureen A. Callanan and Jennifer L. Jipson); (3) "The Rhythms of Scientific Thinking: A Study of Collaboration in an Earthquake Microworld" (Margarita Azmitia and Kevin Crowley); (4) "Acquiring Expertise in Science: Explorations of What, When, and How" (Christian Schunn and John Anderson); (5) "What Scientific Thinking Reveals about the Nature of Cognition" (Kevin Dunbar); (6) "Scientific Thinking: A Cognitive-Historical Approach" (Ryan Tweney); (7) "Complexity, Emergence, and Synthetic Models in Science Education" (David E. Penner); (8) "From Cognition to Instruction to Cognition: A Case Study in Elementary School Science Instruction" (David Klahr, Zhe Chen, and Eva Toth); (9) "Reconsidering the Role of Experiment in Science Education" (Richard Lehrer, Leona Schauble, and Anthony Petrosino); (10) "Developing Reflective Inquiry Practices: A Case Study of Software, Teacher, and Students" (Ben Loh, Brian J. Reiser, Josh Radinsky, Daniel C. Edelson, Louis M. Gomez, and Sue Marshall); (11) "High throughput Discovery: Search and Interpretation on the Path to New Drugs" (Jeff Shrager); (12) "Epistemologically Authentic Scientific Reasoning" (Clark A. Chinn and Betina A. Malhotra); (13) "Everyday Activity and the Development of Scientific Thinking" (Kevin Crowley and Jodi Galco); (14) "Facets of Students' Thinking: Designing To Cross the Gap from Research to Standards-Based Practice" (Jim Minstrell); (15) "The Role of Hypothesis Formation in Psychological Research" (Takeshi Okada and Takashi Shimokido); and (16) "Internet Epistemology: Contributions of New Information Technologies to Scientific Research" (Paul Thagard). (DDR)